WHAT IS CLAIMED IS:

1. A magnetic memory comprising:

first and second wirings intersecting each other and positioned apart from each other;

a magnetoresistance effect film positioned between the first and second wirings and comprising

a magnetic recording layer configured to reverse a magnetization direction thereof by changing a direction of a magnetic field, which is generated by passing writing currents through the first and second wirings, between a first direction and a second direction different from the first direction,

a magnetization pinned layer configured to hold the magnetization direction thereof when the direction of the magnetic field is changed between the first direction and the second direction, and

a nonmagnetic layer intervening between the magnetic recording layer and the magnetization pinned layer; and

a first magnetic film comprising

a first portion facing the magnetoresistance effect film with the first wiring interposed therebetween and

a pair of second portions positioned on both sides of the first wiring and magnetically connected to the first portion, each of the first and second portions comprising either one of a high saturation

magnetization soft magnetic material containing cobalt and a metal-nonmetal nano-granular film.

2. The memory according to claim 1, further comprising a second magnetic film which comprises

a third portion facing the magnetoresistance effect film with the second wiring interposed therebetween and

a pair of fourth portions positioned on both sides of the second wiring and magnetically connected to the third portion, each of the third and fourth portions comprising either one of a high saturation magnetization soft magnetic material containing cobalt and a metal-nonmetal nano-granular film.

3. The memory according to claim 1, wherein the magnetic recording layer is positioned between the second portions.

4. The memory according to claim 1, wherein a length of the first magnetic film along a longitudinal direction of the first wiring is 1.2 times or more a length of the magnetoresistance effect film along the longitudinal direction of the first wiring.

5. The memory according to claim 1, wherein the first magnetic film comprises a high permeable magnetic material as the high saturation magnetization soft magnetic material, the high permeable magnetic material is an alloy containing cobalt or cobalt-iron as a main component, and the first and second wirings contain one

material selected from the group consisting of copper, tungsten, and an alloy of copper and tungsten.

6. The memory according to claim 1, wherein the first magnetic film comprises a high permeable magnetic material or cobalt-iron as the high saturation magnetization soft magnetic material, the high permeable magnetic material is an alloy containing cobalt or cobalt-iron as a main component, and each of the first and second wirings has a multilayered structure including a nonmagnetic layer and a high saturation magnetization soft magnetic material layer.

7. The memory according to claim 1, wherein the first magnetic film comprises at least one film selected from the group consisting of a Co-Fe alloy film, a Co-Fe-Ni alloy film, a Co-(Zr, Hf, Nb, Ta, Ti) film, an amorphous film of these films, and a metal-nonmetal nano-granular film.

8. The memory according to claim 1, wherein the nonmagnetic layer is a nonmagnetic tunnel layer.

9. The memory according to claim 1, further comprising a sense current control element configured to control a sense current to be passed through the magnetic memory.

10. A magnetic memory comprising:

first and second wirings intersecting each other and positioned apart from each other;

a magnetoresistance effect film positioned between

the first and second wirings and comprising

a magnetic recording layer configured to reverse a magnetization direction thereof by changing a direction of a magnetic field, which is generated by passing writing currents through the first and second wirings, between a first direction and a second direction different from the first direction,

first and second magnetization pinned layers sandwiching the magnetic recording layer and each configured to hold a magnetization direction thereof when the direction of the magnetic field is changed between the first direction and the second direction,

a first nonmagnetic layer intervening between the first magnetization pinned layer and the magnetic recording layer, and

a second nonmagnetic layer intervening between the second magnetization pinned layer and the magnetic recording layer; and

a first magnetic film comprising

a first portion facing the magnetoresistance effect film with the first wiring interposed therebetween and

a pair of second portions positioned on both sides of the first wiring and magnetically connected to the first portion, each of the first and second portions comprising either one of a high saturation magnetization soft magnetic material containing cobalt

and a metal-nonmetal nano-granular film.

11. The memory according to claim 10, wherein the second portions are in contact with one of the first and second nonmagnetic layers which is closer to the first magnetic film than the other of the first and second nonmagnetic layers.

12. The memory according to claim 10, further comprising a second magnetic film which comprises

a third portion facing the magnetoresistance effect film with the second wiring interposed therebetween and

a pair of fourth portions positioned on both sides of the second wiring and magnetically connected to the third portion, each of the third and fourth portions comprising either one of a high saturation magnetization soft magnetic material containing cobalt and a metal-nonmetal nano-granular film.

13. The memory according to claim 10, wherein the magnetic recording layer is positioned between the second portions.

14. The memory according to claim 10, wherein a length of the first magnetic film along a longitudinal direction of the first wiring is 1.2 times or more a length of the magnetoresistance effect film along the longitudinal direction of the first wiring.

15. The memory according to claim 10, wherein the first magnetic film comprises a high permeable magnetic

material as the high saturation magnetization soft magnetic material, the high permeable magnetic material is an alloy containing cobalt or cobalt-iron as a main component, and the first and second wirings contain one material selected from the group consisting of copper, tungsten, and an alloy of copper and tungsten.

16. The memory according to claim 10, wherein the first magnetic film comprises a high permeable magnetic material or cobalt-iron as the high saturation magnetization soft magnetic material, the high permeable magnetic material containing cobalt or cobalt-iron as a main component, and each of the first and second wirings has a multilayered structure including a nonmagnetic layer and a high saturation magnetization soft magnetic material layer.

17. The memory according to claim 10, wherein the first magnetic film comprises at least one film selected from the group consisting of a Co-Fe alloy film, a Co-Fe-Ni alloy film, a Co-(Zr, Hf, Nb, Ta, Ti) film, an amorphous film of these films, and a metal-nonmetal nano-granular film.

18. The memory according to claim 10, wherein the nonmagnetic layer is a nonmagnetic tunnel layer.

19. The memory according to claim 10, further comprising a sense current control element configured to control a sense current to be passed through the magnetic memory.

20. A magnetic memory comprising:

first and second wirings intersecting each other and positioned apart from each other;

a magnetoresistance effect film positioned between the first and second wirings and comprising

a magnetic recording layer configured to reverse a magnetization direction thereof by changing a direction of a magnetic field, which is generated by passing writing currents through the first and second wirings, between a first direction and a second direction different from the first direction,

first and second magnetization pinned layers sandwiching the magnetic recording layer and each configured to hold a magnetization direction thereof when the direction of the magnetic field is changed between the first direction and the second direction,

a first nonmagnetic layer intervening between the first magnetization pinned layer and the magnetic recording layer, and

a second nonmagnetic layer intervening between the second magnetization pinned layer and the magnetic recording layer; and

a first magnetic film comprising

a first portion facing the magnetoresistance effect film with the first wiring interposed therebetween and

a pair of second portions positioned on both

sides of the first wiring and magnetically connected to the first portion, the second portions being in contact with one of the first and second nonmagnetic layers which is closer to the first magnetic film than the other of the first and second nonmagnetic layers.

21. A magnetic memory comprising:

first and second wirings intersecting each other and positioned apart from each other;

a magnetoresistance effect film positioned between the first and second wirings and comprising

a magnetic recording layer configured to reverse a magnetization direction thereof by changing a direction of a magnetic field, which is generated by passing writing currents through the first and second wirings, between a first direction and a second direction different from the first direction,

first and second magnetization pinned layers sandwiching the magnetic recording layer and each configured to hold a magnetization direction thereof when the direction of the magnetic field is changed between the first direction and the second direction,

a first nonmagnetic layer intervening between the first magnetization pinned layer and the magnetic recording layer, and

a second nonmagnetic layer intervening between the second magnetization pinned layer and the magnetic recording layer; and

a first magnetic film comprising

a first portion facing the magnetoresistance effect film with the first wiring interposed therebetween and

a pair of second portions positioned on both sides of the first wiring and magnetically connected to the first portion, the magnetic recording layer being positioned between the second portions.